

2. *The European and South African Sea Breams of the Genus Spondyliosoma and Related Genera ; with Notes on Dichistius and Tripteronodon.*—By J. R. NORMAN, Department of Zoology, British Museum (Natural History).

(With Plate II and 6 Text-figures.)

HAVING encountered some difficulty in identifying one or two specimens of Sea Breams allied to *Spondyliosoma* collected by the "Discovery" Expedition at the Cape, I sought the opinion of Dr. K. H. Barnard, Assistant Director of the South African Museum. He was good enough to suggest that I should undertake a revision of these fishes, and very kindly offered, not only to submit all the material in the South African Museum, including the types of the species described by Gilchrist and Thompson, but also to hand over to me some notes he had already prepared with a view to eventual publication. I take this opportunity of offering Dr. Barnard my sincerest thanks for his generosity, and of expressing my appreciation to the authorities of the South African Museum for permission to study this valuable material, which, with the specimens in the collection of the British Museum (Natural History), has enabled me to clear up a number of points concerning this group of fishes. My thanks are also due to Mr. A. Fraser-Brunner, for his assistance in procuring for me a series of specimens of *Spondyliosoma cantharus* from the Mediterranean and from the British coast, and for several helpful suggestions; and to Dr. C. Tate Regan for valuable advice given during the progress of the work. The names adopted for the new species of *Pachymetopon* are those which appear in Dr. Barnard's MSS.

SPONDYLIOSOMA, Cantor.

- Cantharus* (non Bolten, 1798; Montfort, 1808), Cuvier, 1817, R. Anim., vol. ii, p. 278 [*Sparus cantharus*, Linnaeus].
- Spondyliosoma*, Cantor, 1850, J. Asiat. Soc. Bengal, vol. xviii (1849), p. 1032 [*Sparus cantharus*, Linnaeus—a substitute for *Cantharus*, preoccupied].
- Caranthus*, Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 720 [*Sparus cantharus*, Linnaeus—a substitute for *Cantharus*, preoccupied].

Cantharus, Strand, 1928, Arch. Naturgesch., vol. xcii, A. 8, p. 54
[*Sparus cantharus*, Linnaeus—a substitute for *Cantharus*, pre-occupied].

Spondyliosoma (part), Fowler, 1933, Bull. U.S. Nat. Mus., 100 (12), p. 182.

Body ovate covered with rather small, finely ctenoid scales; many scales, especially on hinder part of body, lobate in centre of free margin; tubules of lateral line short, bifurcated posteriorly. Praeorbital narrow, its lower edge generally more or less notched. Posterior nostril slit-like. Teeth in front of jaws in broad bands, that become narrower laterally, arranged in 5 to 7 irregular rows; teeth of the outermost row largest, compressed, narrow, lanceolate; no canines; those of the innermost row mostly obtuse, molariform. Cheek and opercular bones scaled; interorbital region and flange of praeoperculum naked. Dorsal with 11 spines; soft rays naked, but with a low scaly sheath at the base of the fin. Anal with 3 spines.

Two species: one from the Mediterranean and eastern Atlantic; the other from the coast of south-east Africa, Madagascar, and Mauritius.

Synopsis of the Species.

- I. 64 to 72 scales in lateral line, 8 to 10 from origin of dorsal fin to lateral line
1. *cantharus*.
II. 80 to 92 scales in lateral line, 14 or 15 from origin of dorsal fin to lateral line
2. *emarginatum*.

1. *Spondyliosoma cantharus* (Linnaeus).

Sparus cantharus, Linnaeus, 1758, Syst. Nat., ed. 10, p. 280.*

Sparus brama, Bloch, 1791, Nat. ausl. Fische, vol. v, p. 77.

Sparus lineatus, Montagu, 1818, Mem. Werner, N.H. Soc., vol. ii (2), p. 451, pl. xxiii.

Sparus vetula, Couch, 1823, Tr. Linn. Soc. London, vol. xiv (1), p. 79.

Cantharus tanuda, Risso, 1826, H.N. Europe, vol. iii, p. 366.

Pagrus lineatus, Fleming, 1828, Hist. Brit. Anim., p. 211.

Cantharus vulgaris, Cuvier and Valenciennes, 1830, H.N. Poiss., vol. vi, p. 319, pl. clx.

Cantharus brama, Cuvier and Valenciennes, 1830, *t.c.* p. 328; Günther, 1859, Cat. Fish., vol. i, p. 416; Moreau, 1881, H.N. Poiss. France, vol. iii, p. 52; Carus, 1889-93, Prodr. Faun. Medit., vol. ii, p. 626.

* I have not attempted to give a full list of references under each name, but have merely indicated the principal synonyms and combinations of generic and trivial names.

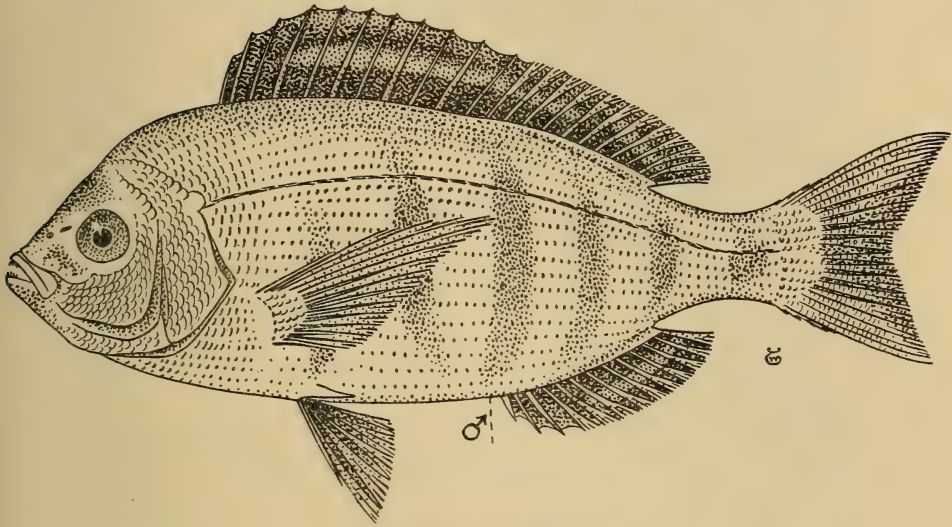


FIG. 1A.—*Spondyliosoma cantharus*. $\times \frac{3}{8}$. ♂.

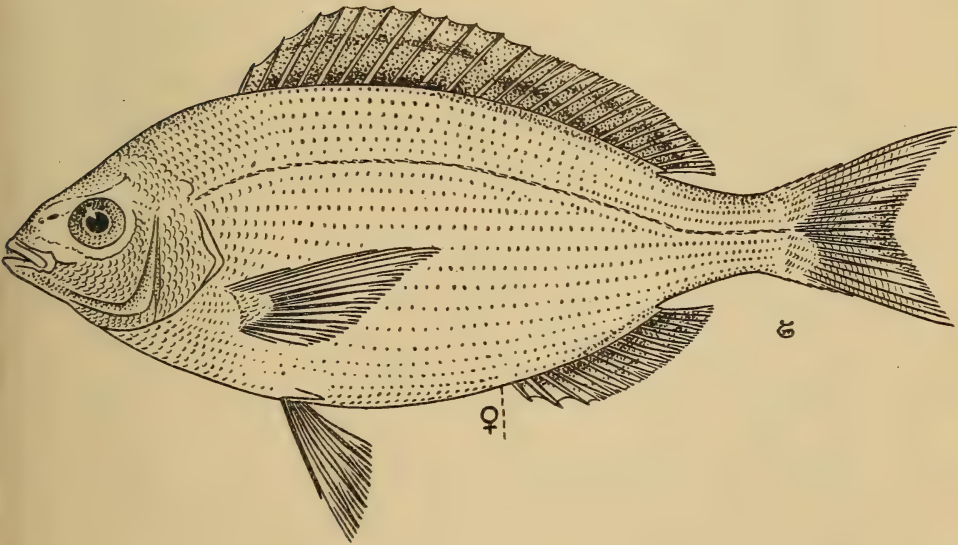


FIG. 1B.—*Spondyliosoma cantharus*. $\times \frac{1}{2}$. ♀.

- Cantharus orbicularis*, Cuvier and Valenciennes, 1830, *t.c.* p. 331; Günther, 1859, *t.c.* p. 416; Moreau, 1881, *t.c.* p. 52; Carus, 1889-93, *t.c.* p. 626.
- Cantharus griseus*, Cuvier and Valenciennes, 1830, *t.c.* p. 333; Lowe, 1839, Tr. Zool. Soc. London, vol. ii, p. 178; Yarrell, 1859, Brit. Fish., ed. 3, vol. ii, p. 165, fig.; Moreau, 1881, *t.c.* p. 49.
- ?*Cantharus senegalensis*, Cuvier and Valenciennes, 1830, *t.c.* p. 337.
- Cantharus lineatus*, Thompson, 1846, Ann. Mag. N.H. (2), vol. xviii, p. 313; Günther, 1859, *t.c.* p. 413; Steindachner, 1867, Sitzungsber. Akad. Wien, vol. lvi (1), p. 649; Day, 1880-84, Fish. Britain, p. 26, pl. ix; Carus, 1889-93, *t.c.* p. 625; Smitt, 1893, Scand. Fish., vol. i, p. 54, fig. 14; Pellegrin, 1914, Ann. Inst. océan., vol. vi, p. 51; Le Gall, 1931, in Joubin, Faune Ichth. Atlant. Nord, No. vi, fig.
- Cantharus linnei*, Malm, 1877, Göteborgs Bohus. Faun., pp. 97, 384.
- Spondyliosoma cantharus*, Jordan and Fesler, 1893, Rep. U.S. Com. Fish., vol. xvii (1889-91), p. 530; Buen, 1926, Cat. ict. Médit. Españ. Marruecos, p. 141.
- Spondyliosoma orbiculare*, Jordan and Fesler, 1893, *t.c.* p. 530.
- Spondyliosoma brama*, Fage, 1907, Arch. Zool. exp. gén. (4), vol. vii, p. 73.
- Caranthus lineatus*, Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 722.
- Depth of body 2 to $2\frac{2}{3}$ in the length, length of head 3 to $3\frac{3}{4}$. Profile more or less straight to occiput, thence moderately convex to origin of dorsal fin. Snout as long as or longer than eye, diameter of which is 3 (young) to $4\frac{1}{3}$ in length of head, 1 to $1\frac{3}{5}$ in interorbital width, and twice or nearly twice depth of praeorbital. Lower edge of praeorbital usually more or less notched, but sometimes nearly straight. 38 to 48 teeth in outer row of upper jaw, 42 to 52 in outer row of lower jaw. 14 to 16 gill-rakers on lower part of anterior arch. 6 or 7 series of scales on cheek; 64 to 72 scales in lateral line, 8 to 10 from origin of dorsal fin to lateral line; scales on upper surface of head extending forward to a point above middle of eye. Dorsal XI 12; 4th to 6th spines longest, length $1\frac{5}{8}$ to $2\frac{1}{3}$ in that of head; first soft ray not or only very little longer than last spine. Anal III 10; 2nd spine a little shorter than 3rd and $1\frac{2}{3}$ to more than twice as long as first; 3rd spine about $\frac{3}{5}$ length of longest dorsal spine. Pectoral with 15 or 16 (occasionally 17) rays, extending to or a little beyond vent or not quite as far, length equal to or rather longer than that of head. Pelvic not reaching vent. Coloration variable; generally silvery grey, with numerous narrow, dark

longitudinal lines on the side, mainly below the lateral line; male with about 6 rather indistinct dark cross-bars on the sides, which are more clearly defined in the young; sometimes some narrow bars between the broader ones; male sometimes with irregular dark patches on head; dorsal and anal fins greyish in the female, more or less spotted and blotched with dusky; in the male these fins are much darker, the dorsal sometimes being quite black; caudal variegated in young, greyish in the adult female, more or less blackish in the male; pectoral pale in the female, dusky in the male; pelvic blackish or brownish in both sexes.

Described from numerous examples, 100 to 390 mm. in total length, from the English Channel, Lisbon, Majorca, Monaco, Naples, Malta, Propontis, Madeira, Mogador, and the Cape Verde Islands.

Hab. : Coasts of south-western Europe, from southern Scandinavia to the eastern Mediterranean; coasts of northern and western Africa, southwards to Angola.

The marked sexual dimorphism in this species does not appear to have been previously recognised, but there is little doubt that the two forms respectively named *S. cantharus* (= *lineatus*, *griseus*) and *S. orbicularis*, both of which have received distinct local names in parts of the Mediterranean, represent the male and female of the same species. In addition to the differences in coloration, which are very marked in the living fish, comparison of specimens of equal size shows that the females have a constantly deeper body, more oblique anterior profile, and a somewhat shorter pectoral fin than the males. Mr. Fraser-Brunner informs me that his experience with Black Bream on the south coast of England suggests that the two sexes shoal separately.

2. *Spondyllosoma emarginatum* (Cuvier and Valenciennes).

Cantharus emarginatus, Cuvier and Valenciennes, 1830, H.N. Poiss., vol. vi, p. 338; Günther, 1859, Cat. Fish., vol. i, p. 416; Kner, 1865, Reise "Novara," Zool., vol. i, 5. Fische, p. 73.

Cantharus microlepis, Gilchrist and Thompson, 1909, Ann. S. Afr. Mus., vol. vi, p. 231.

Scatharus graecus, Clark, 1915, Sci. Res. "Scotia," vol. iv, p. 396.

Pagellus microlepis, Regan, 1921, Ann. Mag. Nat. Hist. (9), vol. vii, p. 419.

Caranthus emarginatus, Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 722.

Caranthus microlepis, Barnard, 1927, *t.c.* p. 723.

Pachymetopon grande, Fowler, 1929, Ann. Natal Mus., vol. vi, p. 259;

Fowler, 1933, Bull. U.S. Nat. Mus., 100 (12), p. 214.

Spondyliosoma microlepis, Fowler, 1933, *t.c.* p. 183.

Spondyliosoma emarginata, Fowler, 1933, *t.c.* p. 183.

Depth of body $2\frac{1}{5}$ to $2\frac{2}{3}$ in the length, length of head 3 to $3\frac{1}{2}$. Profile in smaller specimens nearly evenly convex, but with a slight emargination above eyes, in larger specimens nearly straight to above eyes, thence convex to origin of dorsal. Snout as long as or a little shorter than eye, diameter of which is 3 (young) to nearly 4 in length of head, 1 to $1\frac{1}{2}$ in interorbital width, and 2 to $2\frac{2}{3}$ times depth of

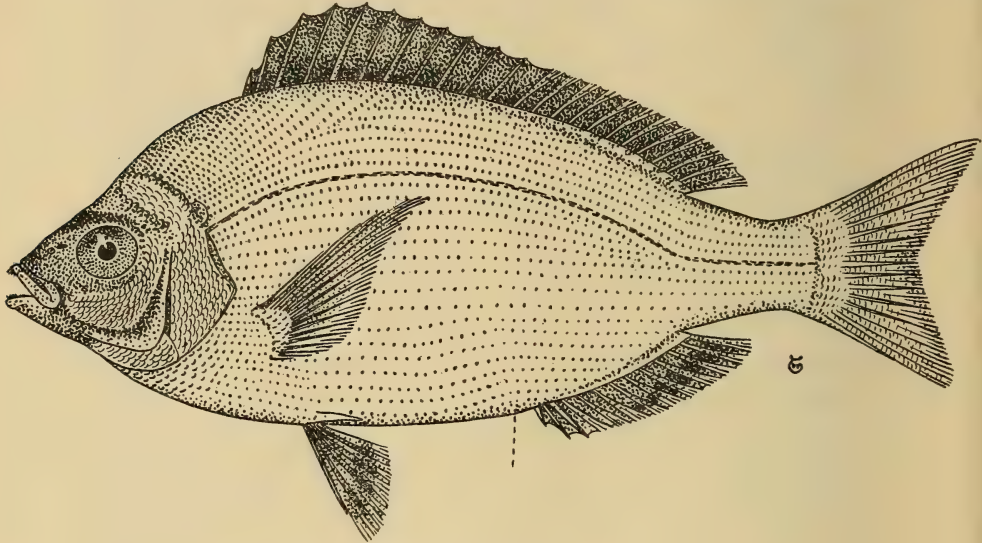


FIG. 2.—*Spondyliosoma emarginatum*. × About $\frac{2}{3}$. ♂.

praeorbital. Lower edge of praeorbital with a notch which is much shallower in the young. 38 to 50 teeth in outer row of upper jaw, 42 to 54 in outer row of lower jaw. 15 to 17 gill-rakers on lower part of anterior arch. 8 series of scales on cheek; 80 to 92 scales in lateral line, 14 or 15 between origin of dorsal fin and lateral line; scales on upper surface of head extending forward to a point behind middle of eye. Dorsal XI 11–13; 4th or 5th spines longest, length $1\frac{1}{3}$ to nearly 3 (generally about twice) in that of head; first soft ray a little longer than last spine. Anal III 10; 2nd spine shorter than 3rd and twice or more than twice as long as first; 3rd spine $\frac{3}{2}$ to $\frac{2}{3}$ length of longest dorsal spine. Pectoral with 15 or 16 rays, extending to a little beyond vent, length about equal to that of head. Pelvic

not or scarcely reaching vent. Greyish or brownish, with traces of dark longitudinal lines on the sides; male with a more or less distinct dark bar between the eyes, and with a dark patch on the suborbitals and on the flange of the praeoperculum; dorsal, anal, and pelvic fins blackish in the male, greyish or dusky in the female; male (?) with a dark spot in the axil of the pectoral.

Described from 13 examples, 105 to 300 mm. in total length, from Table Bay, Simon's Bay, Cape St. Blaize, False Bay, and coast of Natal; including the types of *Cantharus microlepis* and *Pagellus microlepis*.

Hab.: Coast of south-east Africa, from Saldanha Bay to Natal; Mauritius; Madagascar.

This species is clearly related to *S. cantharus*, but the scales are smaller and those on the posterior part of the body more distinctly lobate or even pointed in the centre of the free margin. The two sexes appear to differ somewhat in coloration, but, owing to the small amount of material and the difficulty of sexing many of the specimens, I am unable to say whether there are other differences as in the preceding species. It seems certain that *S. microlepis* is identical with *S. emarginatus*: in 4 examples of the former, including the types of Regan's and Gilchrist and Thompson's species, I count 83 to 92 scales in the lateral line, and in 9 examples of the latter, 80 to 86.

PACHYMETOPON, Günther.

Pachymetopon, Günther, 1859, Cat. Fish., vol. i, p. 424 [*Pachymetopon grande*, Günther].

Caranthus (part), Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 720.

Simocantharus, Fowler, 1933, Bull. U.S. Nat. Mus., 100 (12), pp. 182, 185 [*Cantharus aeneus*, Gilchrist and Thompson].

Spondyliosoma (part), Fowler, 1933, *t.c.* p. 182.

Close to *Spondyliosoma*, but with a deeper praeorbital, the lower edge of which is nearly straight. Teeth nearly all compressed, in 4 or 5 (occasionally 6) rows, those of the outermost row broader and fewer than in *Spondyliosoma*, those of the innermost row not molariform. Dorsal with 10 or 11 spines; soft dorsal and anal densely scaled on basal third of fin, but without sheath.

Five species from South Africa.

Synopsis of the Species.

- I. 26 to 36 teeth in outer row of upper, 36 to 44 in outer row of lower jaw; depth of praeorbital usually less than diameter of eye; 13 to 16 gill-rakers on lower part of anterior arch.
- A. Flange of praeoperculum not scaled; 60 to 66 scales in lateral line; scales on upper surface of head extending forward to a point behind level of middle of eye; pectoral as long as or shorter than head.
1. (28) 30 to 36 teeth in outer row of upper, 40 to 44 in outer row of lower jaw; 1st dorsal spine $\frac{1}{2}$ to $\frac{2}{3}$ eye 1. *blochi*.
 2. 26 to 28 teeth in outer row of upper, 36 in outer row of lower jaw; 1st dorsal spine about $\frac{1}{3}$ eye 2. *canescens*.
- B. Flange of praeoperculum partly scaled; 80 to 86 scales in lateral line; scales on upper surface of head extending forward to above level of anterior part of eye; pectoral $1\frac{1}{2}$ to $1\frac{1}{4}$ times as long as head
3. *aeneum*.
- II. 18 to 22 teeth in outer row of upper, 22 in outer row of lower jaw; depth of praeorbital about equal to diameter of eye; 10 or 11 gill-rakers on lower part of anterior arch.
- A. Depth about $2\frac{1}{2}$ in length; anal III 10; pectoral nearly $1\frac{1}{2}$ times as long as head 4. *grande*.
- B. Depth about $1\frac{5}{8}$ in length; anal III 11; pectoral about $1\frac{1}{3}$ times as long as head 5. *glaucum*.

1. *Pachymetopon blochi* (Cuvier and Valenciennes).

?*Sparus brama*, Bloch, 1791, Nat. ausl. Fische, pl. cclxix.

Cantharus blochii, Cuvier and Valenciennes, 1830, H.N. Poiss., vol. vi, p. 339; Günther, 1859, Cat. Fish., vol. i, p. 416; Kner, 1865, Reise "Novara," Zool., vol. i, 5. Fische, p. 74.

Cantharus castelnaui, Bleeker, 1860, Nat. Tijdschr. Ned. Ind., vol. xxi, p. 59.

Caranthus blochi, Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 721.

Spondylisoma blochii, Fowler, 1933, Bull. U.S. Nat. Mus., 100 (12), p. 184.

Depth of body $2\frac{1}{4}$ to $2\frac{1}{2}$ in the length, length of head 3 to $3\frac{1}{4}$. Profile more or less evenly convex from snout to origin of dorsal. Snout as long as to twice as long as eye, diameter of which is 3 (young) to $5\frac{1}{4}$ in length of head, 1 to $2\frac{1}{2}$ in interorbital width, and $\frac{9}{10}$ to $1\frac{1}{2}$ times depth of praeorbital. Lower edge of praeorbital without notch, the hinder part of the maxillary not concealed. (28) 30 to 36 teeth in outer row of upper jaw, 40 to 44 in outer row of lower jaw; teeth of outer row considerably larger than those of succeeding inner rows, their apices reaching a much higher level. 13 or 14 gill-rakers on lower part of anterior arch. 9 series of scales on cheek; 60 to 66

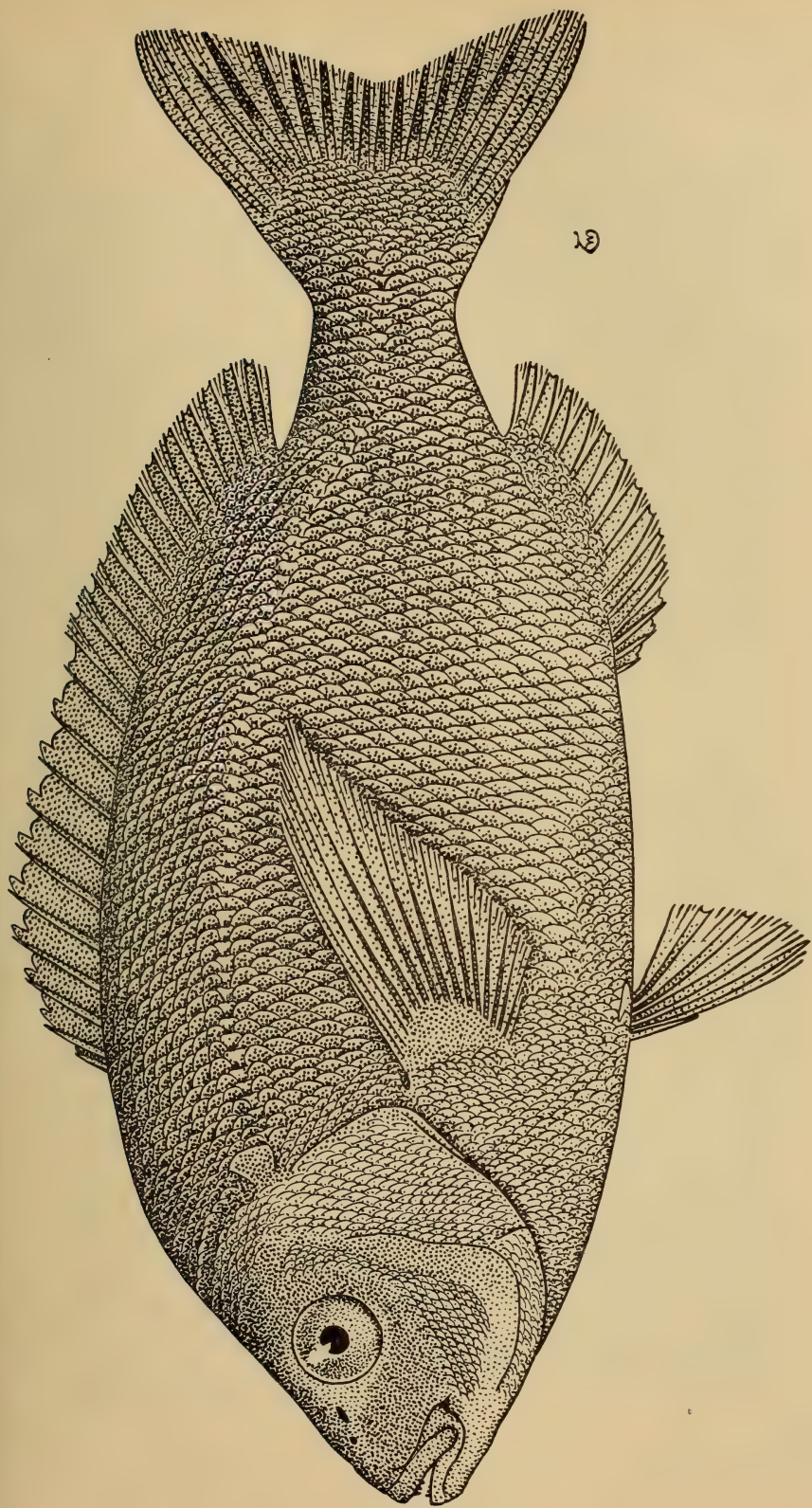


FIG. 3.—*Pachymetopon blochi*. $\times \frac{3}{8}$.

scales in lateral line, 9 or 10 from origin of dorsal fin to lateral line; scales on upper surface of head extending forward to a point behind level of middle of eye; flange of praeoperculum not scaled; scales on caudal fin not extending to its posterior margin. Dorsal X–XI 11–12; length of first spine $\frac{1}{2}$ to $\frac{2}{3}$ diameter of eye; 4th or 4th and 5th spines longest, length about 3 (sometimes 4) in that of head; first soft ray much longer than last spine. Anal III 10; 2nd spine shorter than 3rd and $1\frac{1}{2}$ to twice as long as first; 3rd spine $\frac{3}{5}$ to $\frac{2}{3}$ length of longest dorsal spine. Pectoral with 17 or 18 rays, extending to vent or not quite as far, length equal to or less than that of head. Pelvic not reaching vent. Uniformly greyish or brownish, sometimes with bronze or bluish shades, sometimes darker sometimes paler; usually paler or silvery below.

Described from 10 examples, 85 to 450 mm. in total length, from Saldanha Bay, Table Bay, and False Bay.

Hab.: South-west Africa.

2. *Pachymetopon canescens*, sp. n.

(Plate II.)

Close to the preceding species. Depth of body $2\frac{1}{2}$ in the length, length of head $3\frac{1}{5}$. Snout $1\frac{1}{3}$ times eye, diameter of which is 4 in length of head, $1\frac{1}{2}$ in interorbital width, and $1\frac{2}{5}$ times depth of praeorbital. Praeorbital nearly completely concealing the maxillary. 26 to 28 teeth in outer row of upper jaw, 36 in outer row of lower jaw; teeth of inner series larger than in *P. blochi*, the apices of the teeth in all the rows reaching the same or nearly the same level, at least in lower jaw. 14 gill-rakers on lower part of anterior arch. 8 or 9 series of scales on cheek; about 65 scales in lateral line, 10 from origin of dorsal fin to lateral line. Dorsal X–XI 10–11; length of first spine about $\frac{4}{5}$ diameter of eye; 4th spine longest, length 3 in that of head. Anal III 9–10; 2nd spine shorter than 3rd and about $1\frac{3}{4}$ times as long as first; 3rd spine $\frac{4}{5}$ length of longest dorsal spine. Pectoral with 17 rays, extending to vent, length about equal to that of head. Pale yellowish brown, with a small dark patch below the eye, another larger one on the operculum, and with irregular dark areas on upper parts of sides and on upper surface of caudal peduncle; a number of minute dark dots scattered over head and body, which below the lateral line tend to be arranged in longitudinal rows; similar dots on the rays of the fins.

Described from a single example (holotype), 275 mm. in total

length, believed to be from False Bay: this is the specimen mentioned by Barnard in his monograph of South African Marine Fishes (p. 721). A second specimen (263 mm.), from Kalk Bay, False Bay, is in the South African Museum.

3. *Pachymetopon aeneum* (Gilchrist and Thompson).

Cantharus aeneus, Gilchrist and Thompson, 1908, Ann. S. Afr. Mus., vol. vi, p. 166.

Cantharus natalensis, Gilchrist and Thompson, 1908, *t.c.* p. 167.

Cantharus simus, Gilchrist and Thompson, 1909, *t.c.* p. 231.

Caranthus aeneus, Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 724.

Spondyliosoma aenea, Fowler, 1933, Bull. U.S. Nat. Mus., 100 (12), p. 185.

Depth of body $2\frac{1}{4}$ to $2\frac{1}{2}$ in the length, length of head $2\frac{1}{2}$ to $2\frac{3}{4}$. Profile more or less evenly convex from snout to origin of dorsal, but there is a fairly prominent bulge in front of the eyes, below which the snout is concave. Snout longer than eye, diameter of which is $3\frac{1}{2}$ (young) to $4\frac{1}{3}$ in length of head, $1\frac{1}{4}$ to $1\frac{3}{4}$ in interorbital width, and $1\frac{1}{3}$ to $1\frac{4}{5}$ times depth of praeorbital. Lower edge of praeorbital straight or very little concave, the maxillary not entirely concealed. 30 to 36 teeth in outer row of upper jaw, 36 to 40 in outer row of lower jaw; teeth of inner rows more or less chisel-shaped, usually with a single median point. 15 or 16 gill-rakers on lower part of anterior arch. About 10 series of scales on cheek; 80 to 86 scales in lateral line, 10 to 12 from origin of dorsal fin to lateral line; scales on upper surface of head extending forward to a point above level of anterior part of eye; flange of praeoperculum scaled; scales on caudal fin extending nearly to its posterior margin. Dorsal XI 11; 4th or 4th and 5th spines longest, length 2 to $2\frac{4}{5}$ in that of head; first soft ray longer than last spine. Anal III 10; 2nd and 3rd spines subequal or 2nd a little longer and $1\frac{1}{2}$ to $1\frac{2}{3}$ times as long as first; 3rd spine about $\frac{3}{4}$ length of longest dorsal spine. Pectoral with 16 or 17 rays, extending to or beyond vent, length $1\frac{1}{5}$ to $1\frac{1}{4}$ times that of head. Pelvic not or scarcely reaching vent. Greyish or brownish above, silvery below, with dark longitudinal lines, especially below the lateral line; dorsal, anal, pelvics, and sometimes hinder part of caudal fin blackish or violaceous.

Described from 7 examples, 225 to 430 mm. in total length, including the holotype of the species and the types of *Cantharus natalensis* and *C. simus*.

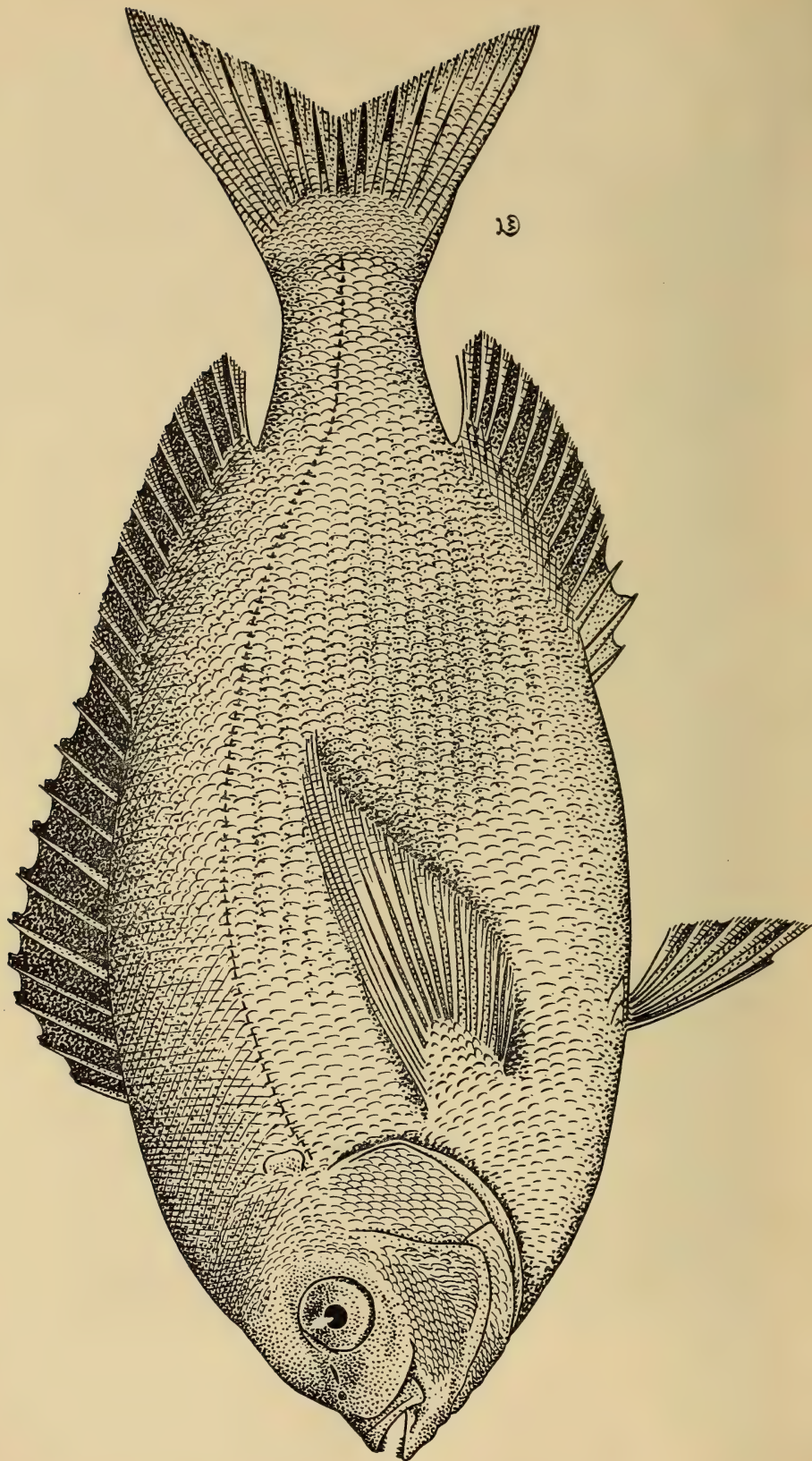


FIG. 4.—*Pachymetopon aeneum*. $\times 3$.

Hab.: Coast of Natal, at certain seasons extending as far westwards as False Bay.

Fowler (1933) makes this species the type of a new subgenus, *Simocantharus*.

4. *Pachymetopon grande*, Günther.

Pachymetopon grande, Günther, 1859, Cat. Fish., vol. i, p. 424; Günther, 1886, Ann. Mag. Nat. Hist. (5), vol. xviii, p. 367; Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 636.

Pachymetopon guentheri, Steindachner, 1869, Sitzungsber. Akad. Wiss. Wien, vol. lx (1), p. 135.

?*Pachymetopon gibbosus*, Pellegrin, 1914, Bull. Soc. zool. France, vol. xxxix, p. 264.

Depth of body about $2\frac{1}{3}$ in the length, length of head about 4. Profile convex from snout to origin of dorsal, with a bulge in front of the eye, more prominent in the larger specimen. Snout longer than eye, diameter of which is 4 in length of head, $1\frac{3}{4}$ in interorbital width, and equal to depth of preorbital. Lower edge of preorbital a little concave, the maxillary not entirely concealed. Apices of teeth truncate, rounded, or with a single median point; 18 to 20 teeth in outer row of upper jaw, about 22 in outer row of lower jaw. 10 or 11 gill-rakers on lower part of anterior arch. 7 series of scales on cheek; about 80 scales in lateral line, 11 from origin of dorsal fin to lateral line; scales on upper surface of head extending forward to a point above level of anterior part of eye; flange of preoperculum not scaled; scales on caudal fin extending nearly to its hinder margin. Dorsal XI 11; 4th to 6th spines longest, length 2 to $2\frac{1}{3}$ in that of head; first soft ray longer than last spine. Anal III 10; 2nd and 3rd spines subequal and $1\frac{1}{4}$ to $1\frac{2}{3}$ times as long as first; 3rd spine about $\frac{2}{3}$ as long as longest dorsal spine. Pectoral with 17 rays, extending to or nearly to origin of anal, length nearly $1\frac{1}{2}$ times that of head. Pelvic scarcely reaching vent. Brownish, with a number of narrow, dark longitudinal lines on the side below the lateral line; spinous dorsal black; soft dorsal and anal blackish or violaceous; pectorals, pelvics, and hinder part of caudal dusky.

Described from 2 examples, 420 and 520 mm. in total length, including the holotype of the species, a stuffed skin, 520 mm. long.

Hab.: Coast of Natal; Cape of Good Hope; Madagascar (?).

Steindachner's description of *P. guentheri* differs a little from the above, but, as he does not state the size of his specimen, it is impossible to say how far these differences are due to age. Günther himself has suggested that *guentheri* and *grande* are identical.

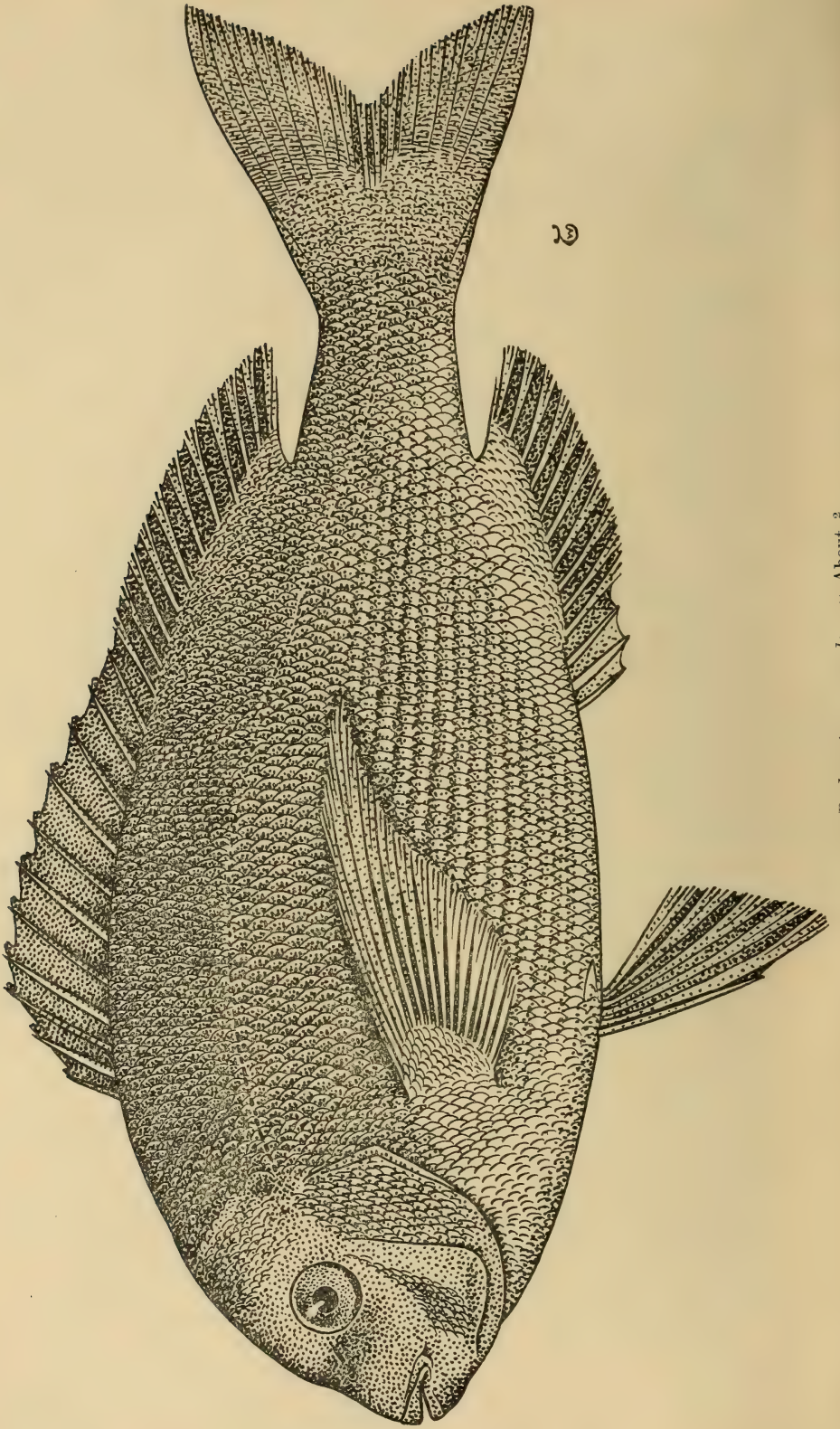


FIG. 5.—*Pachymetopon grande*. × About 3.

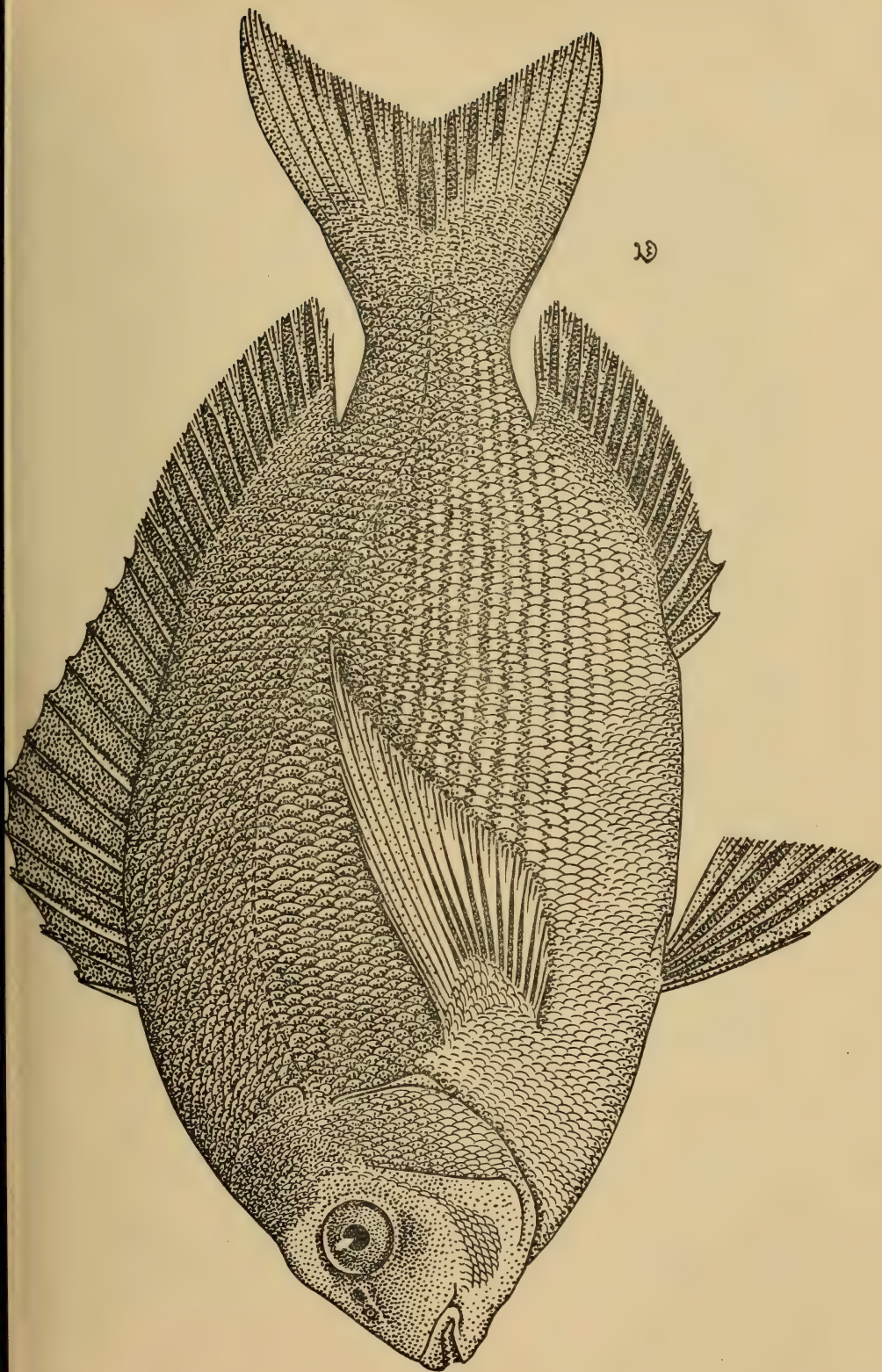


FIG. 6.—*Pachymetopon glaucum*. × About $\frac{2}{3}$.

5. *Pachymetopon glaucum*, sp. n.

Close to the preceding species. Depth of body $1\frac{5}{8}$ in the length, length of head $3\frac{2}{3}$. Diameter of eye $3\frac{2}{3}$ in length of head, $1\frac{2}{3}$ in inter-orbital width, and about equal to depth of praeorbital. Lower edge of praeorbital nearly straight; flange of praeoperculum not scaled. Apices of teeth of inner rows mostly truncate, but sometimes with a small median point or feebly crenulate; 22 teeth in outer row in both upper and lower jaws. 11 gill-rakers on lower part of anterior arch. 85 scales in lateral line, 10 or 11 from origin of dorsal fin to lateral line; caudal fin less densely scaled. Dorsal XI 11; 5th spine longest, length 2 in that of head. Anal III 11; 2nd and 3rd spines subequal, $1\frac{2}{3}$ times as long as first; 3rd spine about $\frac{2}{3}$ as long as longest dorsal spine. Pectoral about $1\frac{1}{3}$ times as long as head. Dark grey above, with a bluish or violaceous tinge, silvery below; a number of narrow, dark longitudinal lines on the side, mainly below the lateral line; dorsal, anal, pelvics, and hinder part of caudal fin dark violaceous; upper part of pectoral dusky, lower part pale.

Described from a single example (holotype), 310 mm. in total length, from East London. This was sent to the South African Museum by Mr. W. L. Wright, Hon. Secretary of the South African Sea-Anglers Association, in June 1933. According to him, this species, locally known as the Blue Fish,* attains a weight of 10 lb., but none of the local anglers have taken one under 2 lb. A prominent frontal gibbosity over the eye is sometimes developed.

Hab. : South Africa.

GYMNOCROTAPHUS, Günther.

Gymnocrotaphus, Günther, 1859, Cat. Fish., vol. i, p. 432 [*Gymnocrotaphus curvidens*, Günther].

Close to *Pachymetopon*, but with no scales on the cheek. Teeth of innermost series more or less obtuse, but not molariform.

A single species from South Africa.

1. *Gymnocrotaphus curvidens*, Günther.

Gymnocrotaphus curvidens, Günther, 1859, Cat. Fish., vol. i, p. 432; Barnard, 1927, Ann. S. Afr. Mus., vol. xxi, p. 727, pl. xxix, fig. 3; Fowler, 1933, Bull. U.S. Nat. Mus., 100 (12), p. 186.

* This vernacular name is apparently applied indiscriminately to several species. Dr. Barnard informs me that examples of *Pachymetopon grande*, *P. aeneum*, *Polyamblyodon germanus*, as well as of another type of Percoid fish, were all sent to the South African Museum as "Blue Fish."

Hab. : False Bay, extending along the coast to East London.

The holotype is a stuffed specimen, 320 mm. in total length, from the "Cape of Good Hope": I have also examined 3 examples in spirit, 175 to 300 mm. in length, from Kalk Bay, presented by the South African Museum in 1932.

POLYAMBLYODON, gen. nov.

Genotype—*Pachymetopon germanum*, Barnard.

Close to *Pachymetopon*, differing in the form of the dentition. An outer row of strong, curved, compressed chisel-like teeth in each jaw, behind which is a broad band composed of 6 or 7 rows of small rounded molariform teeth.

A single species from South Africa.

1. *Polyamblyodon germanus* (Barnard).

Pachymetopon germanum, Barnard, 1934, Ann. Mag. Nat. Hist. (10), vol. xiii, p. 231, fig. 2.

Hab. : Coast of Natal.

The holotype, 382 mm. in total length, in the British Museum collection, is believed to have come from Natal: a second specimen, 375 mm. long, from Durban, is in the South African Museum.

THE SYSTEMATIC POSITION OF DICHISTIUS AND TRIPTERODON.

When he published his classification of the Percoid fishes, Regan * was able to examine only dried specimens of *Pachymetopon* and *Dichistius* (= *Dipterodon*, Cuvier *nec* Lacepède),† both of which he placed with doubt in the family *Girellidae*, a position which they occupy in Barnard's monograph. The close relationship of *Pachymetopon* to the Sparid genus *Spondyliosoma* has already been demonstrated, and the examination of a well-preserved specimen of *Dichistius capensis* leaves little doubt that this genus should be removed from the *Girellidae* and placed in the allied family *Kyphosidae*. The principal characters distinguishing the *Kyphosidae* from the *Girellidae* are the exposed distal part of the maxillary; the scaly

* 1913, Ann. Mag. Nat. Hist. (8), xii, p. 127.

† *Dipterodon*, Cuvier, 1829, is preoccupied by *Dipterodon*, Lacepède, 1802 (type *D. hexacanthus*, Lacepède)—a synonym of *Apogon*. Lacepède's genus includes species of *Lutianus*, *Apogon*, *Aspro*, *Bairdiella*, etc. Gill (1888) has proposed the name *Dichistius* as a substitute. *Coracinus*, Gronovius, 1763, is not accepted (Opinion 89).

gill-membranes, joined to the isthmus; and the outer row of incisors in the jaws, implanted by horizontal roots, behind which is a series of small villiform teeth. In *Dichistius* the roots of the incisors are not conspicuous, and the inner series of teeth is represented by a few small conical teeth which are occasionally present, and are more or less concealed in fleshy pads.* Nevertheless, in other respects this fish appears to be a typical Kyphosid, and the definition of the family should be emended for its inclusion.

Regan did not mention *Tripteron* in his classification, but, here again, at the time that his paper was published the British Museum possessed only the type of *T. orbis*, a dried skin from Playfair's Zanzibar collection. A much smaller example preserved in alcohol was received from Messrs. Marley and Robinson in 1919, but unfortunately the mouth has been damaged and it is impossible to ascertain the form of the jaws. However, I feel certain that this fish cannot belong to the *Sparidae*, and its place is almost certainly either with the *Girellidae* or with the *Ephippidae*. The compressed, tricuspidate teeth are reminiscent of those of *Girella*, but the general appearance of the fish is so like certain species of *Ephippus* and *Chaetodipterus* that it is difficult to believe that they are not related. Pending a study of its osteology, therefore, *Tripteron* may be placed in the family *Ephippidae*.

* Barnard, 1927, Ann. S. Afr. Mus., xxi, p. 635.